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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/531,225   | 04/13/2005  | Helmut Winterling    | 12810-00072-US      | 4572             |
| 30678 7590 09/23/2009<br>CONNOLLY BOVE LODGE & HUTZ LLP<br>1875 EYE STREET, N.W.<br>SUITE 1100<br>WASHINGTON, DC 20006 |             |                      |                     |                  |
| EXAMINER   |             |                      |                     |                  |
| LISTVOYB, GREGORY  |             |                      |                     |                  |
| ART UNIT   |             | PAPER NUMBER         |                     |                  |
| 1796   |             |                      |                     |                  |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/531,225

**Applicant(s)**

WINTERLING ET AL.

**Examiner**

GREGORY LISTVOYB

**Art Unit**

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 6/10/2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3 and 5-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3 and 5-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/CDC)
- Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 7-9, 11-16, rejected under 35 U.S.C. 102(b) as being unpatentable over Hoyt et al (EP 0409093) herein Hoyt as evidences by Lombardi et al (US 3663511), herein Lombardi (cited in the previous Office Action, necessitated by Amendment).

Hoyt discloses a fiber-forming polycaprolactam (see Page 2, line 50 and page 4, line 5, meeting the limitations of claims 7 and 9) comprising a compound which includes at least one hydroxyl group and has chemical bonding by way of an amide group to the end of the polymer chain (see page 4, line 10), which includes at least one terminal hydroxyl group and where the compound which includes at least one hydroxyl group is present in the range from 0.001 to 2 mol%, based on 1 mole of amide groups of the polyamide (see page 4, lines 20-35).

Note that Hoyt does not teach a linear, unbranched alkanemonocarboxylic acid. Instead, he teaches epsilon-caprolactone as a source of hydroxyl groups. (Note that the structures of the resulting polymer of the reference and Application examined are identical.) Hoyt does not clearly disclose a mechanism of forming the above Hydroxyl groups from the lactone.

Lombardi evidences that during the reaction of hexamethylenediamine and epsilon-caprolactone or hydroxycaproic acid (see Example 2), the amide bond forms between amine and acid (see Column 5, line 10). Hydroxyl group stays unreacted (see Example 2). Lombardi teaches 6-Hydroxycaproic acid is equivalent to epsilon-caprolactone in amino-group blocking reaction (see Column 4, line65).

Since formation of amide bond and hydroxyl group can be possible only in case of opening of the lactone ring, Hoyt's polyamide contains a linear, unbranched alkanemonocarboxylic acid residue.

In the instant case substitution of equivalent methods requires no express motivation, as long as the prior art recognizes equivalency, In re Fount 213 USPQ 532 (CCPA 1982); In re Siebentritt 152 USPQ 618 (CCPA 1967); Graver Tank & Mfg. Co. Inc. V. Linde Air products Co. 85 USPQ 328 (USSC 1950).

Therefore, it would have been obvious to a person of ordinary skills in the art to interchangeably use unbranched alkanemonocarboxylic acid or epsilon-caprolactone as a source of hydroxyl groups, since they lead to the same polyamide structure.

Regarding Claim 8, the films based on Nylon 6 are well known. Hoyt's film has low coloration (see Examples), which indicates their higher resistance to oxidative degradation. Also, Hoyt teaches that his polyamide has very good stain resistance (see Page 2, line 40).

Therefore, it would have been obvious to a person of ordinary skills in the art to use Hoyt's modified polyamide in films, since they have good thermo-oxidative stability and stain resistance.

Regarding claim 16, Hoyt teaches a dye in his polyamide (see page 4, line 40).

Claim 5-6, 17-18 rejected under 35 U.S.C. 103(a) as being unpatentable over Hoyt in combination with Brubaker (US patent 2264298, cited in the previous Office Action) as evidences by Lombardi.

Hoyt discloses a polyamide comprising a compound which includes at least one hydroxyl group and has chemical bonding by way of an amide group to the end of the polymer chain (see page 4, line 10), which includes at least one terminal hydroxyl group and wherein the compound which includes at least one hydroxyl group is

present in the range from 0.001 to 2 mol%, based on 1 mole of amide groups of the polyamide (see page 4, lines 20-35).

Lombardi evidences that epsilon-caprolactone (used by Hoyt) and 6-hydroxycaproic acid are equivalent in amine-blocking reaction.

Hoyt and Lombardi do not disclose a method of preparing hydroxyl-capped polyamide. Instead, Hoyt teaches a reaction of polyamide with hydroxyl-containing compound.

Brubaker teaches a method of forming of hydroxyl terminated polyamide, comprising a reaction of caprolactam and hydroxyl-containing amine (see Example 3). Brubaker teaches that his polyamide contains 0.002 % mol of hydroxyl group based on 1 mol amide group (see Example 3).

Brubaker's method has at least two advantages over Hoyt process. Firstly, Brubaker teaches one-step method, compare to two-step process of Hoyt (the first step comprises a synthesis of a polyamide, whereas the second one includes modification of the polymer). Second advantage is that the hydroxyl-containing reagent fulfills the role of a chain length regulator in the Brubaker's process.

Therefore, it would have been obvious to a person of ordinary skills in the art to include caprolactone or hydroxycaproic acid in the synthesis of Hoyt's polyamide in order to

obtain more economical one-step process and optimize molecular weight of the polyamide with the above reagents.

### ***Response to Arguments***

Applicant's arguments filed on 6/10/2009 have been fully considered but they are not persuasive.

Applicant argues that the polyamide prepared according to Hoyt produces no water whereas the polyamide prepared in the disclosure produces water as a by-product and this water forming reaction leads to a polyamine with different physical properties including equal or higher melt volume rate as noted above. Therefore, the use of epsilon-caprolactone is not equivalent to 6-Hydroxycaproic acid as the office has suggested with regard to Lombardi. Applicant further argues that "Applicant's disclosure produces water as a by-product and [that] this water forming reaction leads to a polyamine with different physical properties including equal or higher melt volume rate".

However, as Examiner stated before, water may be related to the composition, based on the polyamide, but not to the polymer itself. Claim 1 claims a polyamide, not a composition. The structure of Hoyt's polyamide is clearly equal to the one of the Application examined.

Due to claim amendments, Rejection under 35 USC 102(b) has been withdrawn.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **GREGORY LISTVOYB** whose telephone number is (571)272-6105. The examiner can normally be reached on 10am-7pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on (571) 272-1078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/James J. Seidleck/  
Supervisory Patent Examiner, Art Unit 1796  
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